Remarks

Claims 1-61 remain pending in the present application. Reexamination and reconsideration are requested in light of the accompanying remarks.

The rejection of claims 1-61 under 35 U.S.C. § 103(a) as obvious over Silver (U.S. Patent No. 6,455,182) in view of Nunan (U.S. Patent No. 6,040,265) is respectfully traversed.

Silver teaches a shift converter in a fuel processing subsystem having an improved catalyst composition. The catalyst composition is a noble metal catalyst having a promoted support of mixed metal oxide, including at least both ceria and zirconia. Abstract.

Silver is not available as a reference against the application. Applicants reduced the claimed invention to practice prior to May 9, 2001 as shown by the previously submitted Declaration of Anca Faur-Ghenciu, Nathan E. Trusty, Mark R. Feaviour, Jessica G. Reinkingh, Phillip Shady, and Paul J. Andersen Under 37 C.F.R. 1.131. Prior to May 9, 2001, water gas shift catalyst systems according to the claims were made.

According to the examiner, "[t]he 1.131 Declaration presented by applicants is not acceptable as it is not commensurate in scope with the instant claims. The catalyst samples prepared and tested as shown in Exhibit E fail to include a catalyst composition equivalent to the one claimed. In particular, there is no one catalyst composition which includes having a noble metal plus either a Cerium Oxide or a Zirconium Oxide plus Yttrium or an Alkali or Alkaline metal (all in claim 1) plus a support dopant selected from lanthanum, praseodymium, neodymium, or combinations thereof (as in claim 7). Therefore, the Declaration does not overcome the prior art of record and therefore the rejection is maintained as set forth above."

Applicant notes that the examiner's statement does not reflect the language of claim 1.

In addition, contrary to the examiner's position, the Declaration is commensurate in scope with claim 1. Applicant may overcome a 35 U.S.C. 103 rejection based on a combination of references by showing completion of the invention by applicant prior to the effective date of any of the references. Applicant's 37 CFR 1.131 affidavit must show possession of either the whole invention as claimed or something falling within the claim(s) prior to the effective date of the reference being antedated. MPEP § 715.02.

Claim 1 recites the use of a "high activity water gas shift catalyst system comprising a noble metal; a mixed metal oxide support consisting essentially of cerium oxide and zirconium oxide, wherein cerium oxide is present in an amount from about 58% to about 80% by weight of

mixed metal oxide and zirconium oxide is present in amount from about 42% to about 20% by weight of mixed metal oxide; and a promoter comprising yttrium, alkali metals, or alkaline earth metals, or combinations thereof." The Declaration shows possession of that invention.

Exhibit E is a summary exhibit correlating the Catalyst ID, Test Number, and Catalyst Composition to make it easier to identify what Exhibits A-D show. Exhibit C includes a chart showing the following Catalyst ID and Test Numbers:

C480-112A	FPR 135
C480-112B	FPR 139
C480-112C	FPR 138
1757-161B	
1757-162B	

The presence of the Catalyst ID indicates that the catalyst had been made, and the presence of the Test Numbers indicates that the catalyst had been tested.

Exhibit D includes a similar chart with additional Catalyst IDs and Test Numbers:

C480-112A	FPR 135
C480-112B	FPR 139
C480-112C	FPR 138
1757-161B	FPR 146
1757-162B	FPR 148
1757-166A	FPR 156
1757-166B	FPR 157
1757-167B	FPR 159

Exhibit D also includes graphs showing the results of the testing of different catalysts. Among those shown are FPR 146, FPR 148, FPR 150, FPR 156, FPR 157, and FPR 159.

Exhibit E shows the compositions of those catalysts.

C480-112A	FPR 135	Li-0.5%Rh/58%CeO_2-42%ZrO_2
C480-112B	FPR 139	Cs,0.5%Rh/58%CeO_2-42%ZrO_2
C480-112C	FPR 138	Cs,1%Rh/58%CeO_2-42%ZrO_2
1757-161B	FPR 146	2%Pt/58%CeO_2-42%ZrO_2
1757-162B	FPR 148	2%Pt/0.2%Cs/58%CeO_2-42%ZrO_2
1757-163B	FPR 150	2%Pt/0.2%Cs/58%CeO_2-42%ZrO_2
1757-166A	FPR 156	2%Pt/58%CeO_2-42%ZrO_2
1757-166B	FPR 157	2%Pt/0.2%Cs/58%CeO_2-42%ZrO_2
1757-167B	FPR 159	2%Pt/0.2%Cs/58%CeO_2-42%ZrO_2

Thus, FPR 135, FPR 139, FPR 138, FPR 148, FPR 150, FPR 157, and FPR 159 show catalyst compositions meeting the limitations of claim 1. Therefore, Applicants' Declaration

shows possession of the whole invention claimed in claim 1 prior to the effective date of the reference being antedated as required by MPEP § 715.02. Applicants are not required also to show possession of the optional support dopant of dependent claim 7.

Because Silver is not available as a reference, applicants respectfully request that the rejection under 35 U.S.C. § 103(a) as being unpatentable over Silver in view of Nunan be withdrawn.

Furthermore, even if Silver is available as a reference, the combination of Silver and Nunan would not render the claimed invnetion obvious. Even after *KSR International Co. v. Teleflex Inc.*, 550 U.S. __, 82 USPQ2d 1385 (2007), in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some reason why a person of ordinary skill in the art would modify the reference or combine reference teachings in the manner claimed. Second, there must be a reasonable expectation of success. The reason to make the combination or modification and the reasonable expectation of success must not be based on applicant's disclosure. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2141-2143. Here, there is no reason to combine the references, and no reasonable expectation of success.

With respect to Nunan, the examiner stated that "Nunan teaches an apparatus for reducing an amount of carbon monoxide in process gas wherein the catalyst is a ceria based catalyst which promotes water gas shift reactions (col. 1, lines 43-56)." Nunan does not teach or suggest use of their catalyst in a water gas shift converter, as discussed in the Amendment filed July 23, 2007.

Nunan teaches a method of making a promoted support for improved catalysts for conversion of exhaust from internal combustion engines. The support comprises a mixed metal oxide promoter containing at least Ce and Zr substantially uniformly dispersed as homogeneous crystallites of less than about 100 Å on a high surface area refractory oxide support substrate. The method includes dissolving a combination of Ce- and Zr-oxide precursors, and optionally another metal oxide precursor, and a compatible organic depositing agent, slowly heating to transform the depositing agent into a gel-like matrix coating the substrate in which the mixed metal oxide precursor compounds are uniformly distributed and thereafter calcining to burn off the organic matrix and form the appropriate oxide morphology. Abstract.

Nunan's catalyst is an exhaust gas catalyst for internal combustion engines. See Title; Abstract; col. 1, lines 14-21; col. 2, lines 46-51; col. 4, lines 36-38; col. 7, lines 21-25; col. 9, lines 25-27; col. 9, line 56 to col. 10, line 6; col. 25, lines 3-22; col. 26, lines 20-55; col. 28, lines 35-45; col. 29, lines 10-18; col. 32, lines 38-53; and claims 1-2. Figs. 1-2, and 16-25 show hydrocarbon conversion as a function of the air to fuel (A/F) ratio.

Nunan teaches three way catalysts (TWC) for vehicle exhaust conversion. There are three reactions involved, including: 1) reducing nitrogen oxides to nitrogen and oxygen, $2NO_x \rightarrow xO_2 + N_2$; 2) oxidation of carbon monoxide to carbon dioxide : $2CO + O_2 \rightarrow 2CO_2$; and 3) oxidation of unburned carcinogenic hydrocarbons (HC) to carbon dioxide and water: $2C_xH_y + (2x+y/2)O_2 \rightarrow 2xCO_2 + yH_2O$. See col. 14, lines 27-39; col. 21, lines 17-60, and Tables 3-5, 7-8. These reactions are simultaneous when the A/F ratio is properly adjusted in order to have the proper amount of hydrocarbons to be converted on account of the NO_x which is being reduced.

These reactions are different from the water gas shift reaction, in which the inlet is carbon monoxide and water. The water gas shift reaction involves conversion of carbon monoxide and water to carbon dioxide and water: $CO + H_2O \rightarrow CO_2 + H_2$. Paragraph [0007]. Thus, Nunan's patent, which involves different reactions taking place with different inlet gases and producing different outlet gases, does not teach or suggest using its motor vehicle exhaust conversion catalyst for water gas shift reactions.

The examiner's citation, col. 1, lines 43-56, does not indicate that Nunan's catalyst could be used in a water gas shift converter. This section primarily discusses prior art motor vehicle exhaust conversion catalysts.

> *Motor vehicle exhaust conversion catalysts* are normally operated under conditions which inherently swing between oxidizing and reducing as an oxygen sensor and its control system keep the air/fuel ratio within the desired operating A/F window around the stoichiometric value. Ceria is a well-known component of *such exhaust conversion catalysts*. It is often referred to as an "oxygen storage" agent because it is considered to have the ability to give up oxygen when the catalyst is exposed to reducing conditions and to re-oxidize when exposed to oxidizing conditions. It has also been suggested that ceria may stabilize the support structure, promote the activity of the precious metals, or promote the water gas shift reaction. See for example, B. Harrison, A. F. Diwell and C. Hallet, Platinum Metals Rev., 1988, 32(2), 73-78.

Col. 1, lines 43-56. The mere statement that it has been *suggested* that ceria *might* promote the water gas shift reaction is not a teaching or suggestion that Nunan's catalyst (which is not just ceria), or any other motor vehicle exhaust conversion catalysts, could be used in a water gas shift converters.

The examiner stated that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the catalyst of Silver with the catalyst composition taught by Nunan in order to provide an enhanced Ce or Zr promotional effect on catalyst performance in CO and NOx oxidation." However, there is no NOx oxidation in Silver, and the CO reactions in Silver and Nunan are completely different. Therefore, there is no reason to combine the references.

In addition, there is no reasonable expectation of success for such a combination given the differences between the reactions and inlet gases.

Therefore, claims 1-61 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Silver in view of Nunan.

CONCLUSION

Applicants respectfully submit that, in view of the above remarks, the application is now in condition for allowance. Applicant respectfully requests that claims 1-61 be passed to allowance.

If the Examiner has any questions or comments regarding the present application, he is invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,
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Enclosures